(17)

$\sqrt{3x+13} - 5 = x$

$+5 \quad +5$

$\sqrt{3x+13} = x+5$

$(\ )^2 \quad (\ )^2$

$3x+13 = (x+5)^2$

$3x+13 = (x+5)(x+5)$

$3x+13 = x^2+5x+5x+25$

$3x+13 = x^2+10x+25$

$-3x \ -13 \quad -3x \ -13$

$0 = x^2+7x+12$

$0 = (x+3)(x+4)$

$x = -3, -4$

Check

$\sqrt{3(-3)+13} - 5 \stackrel{?}{=} -3$

$\sqrt{-9+13} - 5 = -3$

$\sqrt{4} - 5 = -3$

$2 - 5 = -3$ ✓

$\sqrt{3(-4)+13} - 5 = -4$

$\sqrt{1} - 5 = -4$

$1 - 5 = -4$

$-4 = -4$ ✓

21

$$\sqrt{3x} = \sqrt{x+6}$$

$$(\quad)^2 \qquad (\quad)^2$$

$$3x = x + 6$$

$$-x \qquad -x$$

$$\frac{2x}{2} = \frac{6}{2}$$

$$\boxed{x = 3}$$

Check

$$\sqrt{3 \cdot 3} = \sqrt{3+6}$$

$$\downarrow$$

$$\sqrt{9} = \sqrt{9} \quad \checkmark$$

(18)

$\sqrt{x+7} + 5 = x$

$-5 \quad -5$

$\sqrt{x+7} = x - 5$

$(\ )^2 \quad (\ )^2$

$x + 7 = (x-5)^2$

$x + 7 = (x-5)(x-5)$

$x^2 - 5x - 5x + 25$

$x + 7 = x^2 - 10x + 25$

$-x \ -7 \qquad -x \ -7$

$0 = x^2 - 11x + 18$

$0 = (x-2)(x-9)$

$x = \cancel{2}, 9$ extraneous

Check

$\sqrt{2+7} + 5 = 2$

$3 + 5 \neq 2$

Check

$\sqrt{9+7} + 5 = 9$

$4 + 5 = 9$ ✓

19

$(x+3)^{\frac{1}{2}} - 1 = x$

$+1 \quad +1$

$(x+3)^{\frac{1}{2}} = x+1$

$\sqrt{x+3} = x+1$

$(\ )^2 \quad (\ )^2$

$x+3 = (x+1)^2$

$x+3 = (x+1)(x+1)$

$= x^2 + x + x + 1$

$x+3 = x^2 + 2x + 1$

$-x \quad -3 \quad -x \quad -3$

$0 = x^2 + x - 2$

$0 = (x+2)(x-1)$

$x = -2, 1$ (extraneous)

Check

$(-2+3)^{\frac{1}{2}} - 1 = -2$

$\sqrt{1} - 1 \neq -2$

Check

$(1+3)^{\frac{1}{2}} - 1 = 1$

$\sqrt{4} - 1$

$2 - 1 = 1$ ✓

7.5

- #23-29(odd), 35, 38, 39, 40, 42

- HW

  p. 424 #44-56

(42)

$$\sqrt{x} = \sqrt{x-8} + 2$$

$$-2 \qquad -2$$

$$(\sqrt{x}-2)^2 = (\sqrt{x-8})^2$$

$$(\sqrt{x}-2)^2 = x-8$$

$$(\sqrt{x}-2)(\sqrt{x}-2) = x-8$$

$$\sqrt{x^2} - 2\sqrt{x} - 2\sqrt{x} + 4 = x-8$$

$$\sqrt{x^2} - 4\sqrt{x} + 4 = x-8$$

$$x - 4\sqrt{x} + 4 = x-8$$

$$-x \qquad -4 \qquad -x \quad -4$$

$$\frac{-4\sqrt{x}}{-4} = \frac{-12}{-4}$$

$$(\sqrt{x})^2 = (3)^2$$

$$x = 9$$